DEVELOPING AN INTELLIGENT PLAYER FOR PONG GAME

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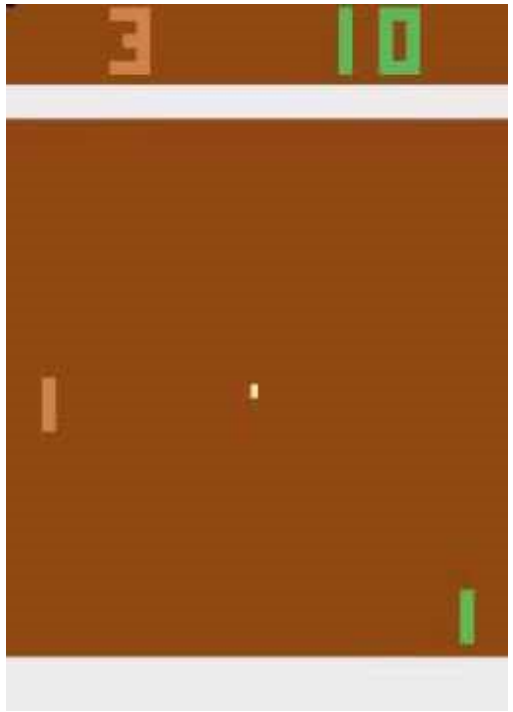
INTRODUCTION

Pong is a classic arcade game. It is a 2D sports game that simulates table tennis. The player has to move the paddle up or down to hit the ball.

Player scores a point when opponent misses the ball. Goal is to score more points than the opponent.



OBJECTIVES

In this project we will use Deep Reinforcement learning to create an intelligent player by using screen images as input.

Agent's performance is measured by the points scored by it.

LITERATURE REVIEW

Some of the areas in game playing using AI in which research has been done are:

1) Basic decision making : It uses hardcoded conditional statements to check the current state of the environment and then immediately take a decision on how to act.

2) Monte Carlo Tree Search : It analyses the most promising moves by expanding the search tree based on random sampling of the search space.

3) Genetic Algorithms : A simple, gradient-free, population based genetic algorithm is used to evolve the weights of a deep neural network.

TASKS

1) Create a neural network that take the screen image as input and outputs the probability of moving up or down.
2) Train this neural network using Deep Q-Learning.

REFERENCES

[1] Ian Wright, James Marshall - "RC++: a rule-based language for game AI"
[2] Justin Fu, Irving Hsu – "Model-Based Reinforcement Learning for Playing Atari Games"
[3] Felipe Petroski Such, Vashisht Madhavan , Edoardo Conti, Joel Lehman, Kenneth O. Stanley, Jeff Clune - "Deep Neuroevolution"